- Brief description

The DS11M system is a high speed outdoor Wireless Bridge utilizing the IEEE 802.11b 2.4G Wireless LAN protocol. The DS11M system modem & Radio unit are based on the Intersil PRISIM II chipset.

The BU and the RB are combined from the following sub systems (IDU and ODU). The ODU is combined from three sub systems.

- DC & protection unit
- MAC / controller, clock, low voltage power supply unit
- PHY Unit

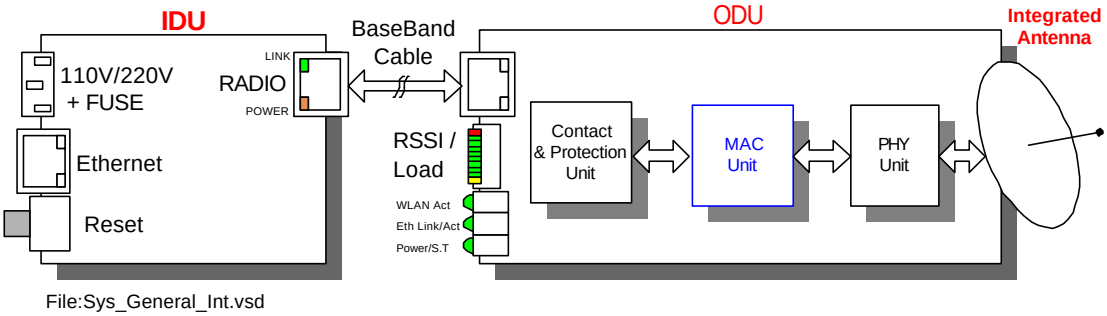
The IDU unit includes the following:

- AC2DC power supply unit
  - AC: 110 or 220V, external fuse, internal AC inlet selector (In from the main line)
  - DC: 500mA @ 43V (out to the ODU unit)

The ODU unit includes the following:

- DC2DC converter (switcher).
  - High voltage DC input: 20 – 70V (48V optimal)
  - Low voltage DC output: 3A @ 5V

- MAC/controller.
- PHY (radio & modem).
  - PRISM 2 chipset
    - Base band processor.
    - I/Q modulator demodulator which operates at 374MHz
    - Tx/Rx SAW filter, 374MHz.
    - Up/Down converter.
  - Power amplifier.
  - Tx/Rx switch.
  - Diversity switch.
  - IF/RF local oscillators.



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The IDU via the Ethernet port (In/Out) transfers the data.
The data and power go (data From/To, power To) from the IDU to the ODU part via the base band Cable.

The power goes to the DC2DC converter.
The data goes to (from) the MAC unit, which in return moves it to (from) the PHY unit (radio).
Tx direction:
The base band (data) is the input for the I/Q modulator, which operates at 374MHz.
The modulated IF signal (374MHz) passes trough a SAW BPF and then passes to the up converter which takes the modulated IF signal and shifts it to the 2.5GHz band.
The RF modulated signal goes trough a power amplifier towards the output via a Tx/Rx switch and 2.4-2.5GHz BPF.
The output signal is monitored via a peak detector, which gives the modem a feedback relative to the output power. The modem causes a change in the IF section gain and in return controls the output power.
Rx direction:
The receiving signal, 2.5GHz band, and pass trough the 2.4-2.5GHz BPF & Tx/Rx switch to a low noise amp. And then through a down converter which shifts the receive frequency to the IF (374MHz). Then the signal passes through the SAW BPF and enters the IF strip amp. and I/Q demodulator where the gain of the IF strip is controlled by the modem in the base band prospector.
The modulated signal from the I/Q demodulator is sampled by the modem (A/D operation) and transferred towards the MAC unit.

1. Modulation Types
   DBPSK, DQPSK, CCK
   DBPSK Differential Binary Phase Shift Keying
   DQPSK Differential Quadrature Phase Shift Keying
   CCK Complementary Code Keying
   In general we should prefer to work with a CCK modulation since we can transmit 5.5Mbit/Sec or 11Mbit/Sec. Where the DBPSK and DQPSK Modulation types can transmit only 1Mbit/Sec and 2Mbit/Sec respectively.
   As increasing the bit rate from 1Mbit/sec to 11Mbit/Sec the required Signal to Noise ratio (SNR) become higher. Since the link budget is limited the system shift from one rate to a lower rate automatically to meet the required S/N.

2. Different antenna Types
   The antenna type that we are using depends in the application. There are 2 kinds of applications:
   1) Point To Multi Point (PTMP).
   2) Point To Point (PTP).

In PTMP applications we can see the base unit (BU) at a center point surrounded by remote bridge (RB) units. In this case the BU antenna will be an OMNI directional antenna (MFB24008) and the RB units antenna will be a directional antenna.

In this case we can choose for the RB units two different antennas:

An integral antenna (Directional Antenna) or external (Directional Antenna).

The difference between the two antennas is the gain where the integral antenna (MT30081) has 15.5dBi gain and the External directional has 24dBi gain.

In general we should prefer to work with the integral antenna since it is more cost effective solution. But in a case where we need extra range then we shall use the external directional antenna with the higher gain.

In PTP applications both the BU & RB units will use directional antennas which can be integral or external ones and the criteria to use one or other is the same as in the RB units in PTMP applications.

There will be occasions where we will be using 2 Directional external antennas.

In these occasions the 2 antennas offer us diversity in receiving and help us to overcome propagation problems like fading.

Supported standards

- Compliant with ETS 300 328 and ETS 300 826 (CE marked)
- IEEE 802.11 TGb standard for Wireless LAN at 11 and 5.5 Mbps
- IEEE 802.11 standard for 1 and 2 Mbps
- Most of the major networking protocols (including IP, IPX)

Power Specifications

Power Supply Input (via Indoor unit)	207VAC - 253VAC 250mA OR 100VAC - 120VAC 500mA AC Mains option is factory wired.
Power Supply Output (from Indoor unit to Outdoor unit)	48VDC

Wired LAN Interface

Compliant with	Ethernet/IEEE 802.3 CSMA/CD
Physical interface	10Base-T
Connector type	RJ-45
Network operating systems	All
Wireless LAN interface	Compliant with IEEE 802.11

Radio Specifications

Type	Direct sequence spread spectrum
Range	Europe/ETSI: 15Km USA/FCC: 24Km (15 miles)
Transmit power	Range: 24dBm (max) to -4dBm (min) Dependable upon Antenna type , system app. & country regulation.
Frequency range	2.4-2.4835 Ghz
Number of channels	Europe: 13 (3 non-overlapping) US: 11 (3 non-overlapping) France: 4 (1 non-overlapping)

Sensitivity

@ 1Mbps	-92dBM, IE-5 BER
@ 2Mbps	-88dBM, IE-5 BER
@ 5.5Mbps	-87dBM, IE-5 BER
@ 11Mbps	-85dBM, IE-5 BER

Configuration and Management

Configuration and setup	SNMP and Windows-based Manager utility
Site survey	Yes
LED indicators	Yes
SNMP management	Yes

Specific Features

Data rate	11 Mbps 5.5 Mbps 2 Mbps 1Mbps
Utility Software	BreezeNET Management utility, runs on Windows 95 and Windows NT

Size

Dimensions (without antennas)	TBD

Environmental

	Indoor Unit	Outdoor Unit
Operating temperature (ambient)	0°C to 40°C (32°F to 104°F)	-40°C to 50°C (-40°F to 122°F)
Storage temperature	-5°C to 70°C (23°F to 158°F)	-5°C to 70°C (23°F to 158°F)
Operating humidity	10% to 90% (non-condensing)	10% to 90% (non-condensing)
Storage humidity	10% to 90% (non-condensing)	10% to 90% (non-condensing)